AMERICAN MUSEUM
Novitates

PUBLISHED BY THE AMERICAN MUSEUM OF NATURAL HISTORY
CENTRAL PARK WEST AT 79TH STREET, NEW YORK, NY 10024
Number 3257, 25 pp., 80 figures March 4, 1999

On the Genera of the Spider Subfamily Otiothopinae (Araneae, Palpimanidae)

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ABSTRACT

New information on cheliceral and genitalic morphology supports the monophyly of the genus *Anisaedus* Simon and suggests that *A. gaujoni* Simon from Ecuador and northern Peru and *A. stridulans* González from southern Peru are sister species, that *A. pellucidas* Platnick from northern Chile is their closest relative, and that *A. rufus* (Tullgren) from northern Argentina represents the sister group of the three west Andean species. Three new species of the genus *Fernandezina* Birabén are described: *F. maldonado* from Peru, *F. dasilvai* from the Atlantic forests of Rio de Janeiro, Brazil, and *F. ilheus* from the Atlantic forests of Bahia, Brazil. A new species, *Otiothops atlanticus*, is described, also from the Atlantic forests of Bahia, that has the most unusual genitalic features of any known otiothopine, but appears nevertheless to be most closely related to *O. recurvus* Platnick. A new genus, *Notiothops*, is described to contain two Chilean species previously misplaced in *Otiothops*, *N. birabeni* (Zapfe) and *N. maulensis* (Platnick), as well as six new species (*N. noxiosus*, *N. huaquen*, *N. campana*, *N. penai*, *N. llolleo*, and *N. cekalovici*) from Chile.

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ISSN 0003-0082 / Price $3.20

INTRODUCTION

The spider subfamily Otiothopinae is known only from the New World, and currently contains only three genera: *Othiothops* MacLeay, *Anisaedus* Simon, and *Fernandezina* Birabén. A key to the genera was provided by Platnick (1975), and subsequently revised (for the worse, as it now appears) by Platnick (1977). Our purpose here is to provide an update to knowledge of *Anisaedus* and *Fernandezina*, to describe a newly discovered, remarkable palpimanid known only from the Atlantic forests of Bahia, Brazil, and to describe a new genus that contains two previously known as well as six new species from Chile.

In addition, we present new data on the structure of the female genitalia in these spiders, based on new and detailed dissections (see the Materials and Methods section below). These results indicate that previous assessments have in some cases been made on the basis of juvenile, rather than adult, material, and that new findings on the female genitalia of other palpimanoids can be expected when detailed dissection methods are applied to those taxa.

MATERIALS AND METHODS

The internal female genitalia and tracheae were observed after digestion in potassium hydroxide (KOH). To enable the KOH solution to contact internal tissues, a wide opening must be made on the abdomen. To prevent damage to internal structures, however, only a superficial incision through the dorsal abdominal cuticle was made, demarcating the portion of cuticle to be removed. The abdomen was then immersed in a 10–20% solution of KOH at 100°C in a double boiler, until appropriate digestion occurred (ca. 5 minutes), and then observed in alcohol. Any remaining soft tissues were removed with a focused current of alcohol expressed through a very thin pipette. The remaining pieces of cuticle were mounted in excavated glass slides with alcohol and a glass cover slip, and observed under a compound microscope.

ABBREVIATIONS USED IN FIGURES:

B	bursa
Bl	book lung
EF	epigastric furrow
LCD	lateral copulatory duct
LT	lateral tracheae
MCD	median copulatory duct
MR	median receptaculum
MT	median tracheae
PE	posterior extension of bursa
Ppl	pore plate
R	receptaculum
UE	uterus externus

In describing the female genitalia, "anterior" and "posterior" refer to structures situated anteriorly and posteriorly to the uterus externus, the thin, flat, membranous (but chitinous, remaining after KOH digestion) duct that connects the bursa with the ovaries (through the uterus internus). The epigastric furrow leads immediately into the bursa, an area where the ducts or entrances of the receptacula, the uterus externus, and (if present) the posterior extension of the bursa are all connected. The "median receptaculum" is an anterior sack bearing the pore plate, and is often paired. The term "receptaculum" refers to the anterior, small, spherical-shaped bodies connected by a duct to, or close to, the base of the median receptaculum. In some species there are several receptacula of this kind, which may be attached to the median receptaculum(a) anteriorly, laterally, or posteriorly. The "posterior extension of bursa" is a posterior sack arising from the posterior wall of the bursa.

All measurements are in millimeters.

ACKNOWLEDGMENTS:

Fieldwork for this project was supported by National Science Foundation grant BSR-9024566. Specimens are deposited in the collections of the American Museum of Natural History (AMNH), Museo Argentino de Ciencias Naturales, Buenos Aires (MACN), Museo de La Plata (MLP, courtesy of L. Pereira), Museo Nacional de Historia Natural, Santiago (MNHNS, courtesy of A. Camousseight), Museu Nacional, Rio de Janeiro (MNRJ, courtesy of A. Kury), Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima (MUSM, courtesy of D. Silva), and Museu de Zoologia, Uni-

versidade de São Paulo (MZUSP, courtesy of R. Pinto-da-Rocha).

We thank Drs. D. Agosti, A. N. Andersen, and T. Churchill for collecting and bringing to our attention some of the Brazilian palpimanids described below, M. U. Shadab for assistance with illustrations, and A. B. Bonaldo, A. D. Brescovit, and R. R. Forster for helpful comments on a draft of the manuscript.

ANISAEDUS SIMON

When this genus was revised by Platnick (1975), the four South American species then (and still) regarded as valid were known from a total of only 13 adult specimens (two additional names currently assigned to the genus, *A. aethiopicus* Tullgren and *A. levii* Chickering, refer to misplaced members of the Chediminae). Since that revision was completed, additional material has become available for study, and the new specimens allow several morphological peculiarities of the genus to be detailed. Although the monophyly of *Anisaedus* is supported by the unique pair of recurved elevations situated near the posterior tip of the sternum (Platnick, 1975: fig. 82), the interrelationships of the four species are probably not those suggested by Platnick (1975: 22).

Examination of the chelicerae of an adult male of the Chilean species *A. pellucidas* Platnick has revealed a number of curious specializations. First, the posterior surface of each chelicera bears a very large, distinct, deep, circular pit (figs. 1, 2); the cuticle at the bottom of the pit bears numerous small pores, presumably the openings of glands (figs. 3, 4). This pit is situated far from the cheliceral peg teeth and the pore-bearing cheliceral gland mound (figs. 1, 5, 6) that are typical of palpimanoids in general.

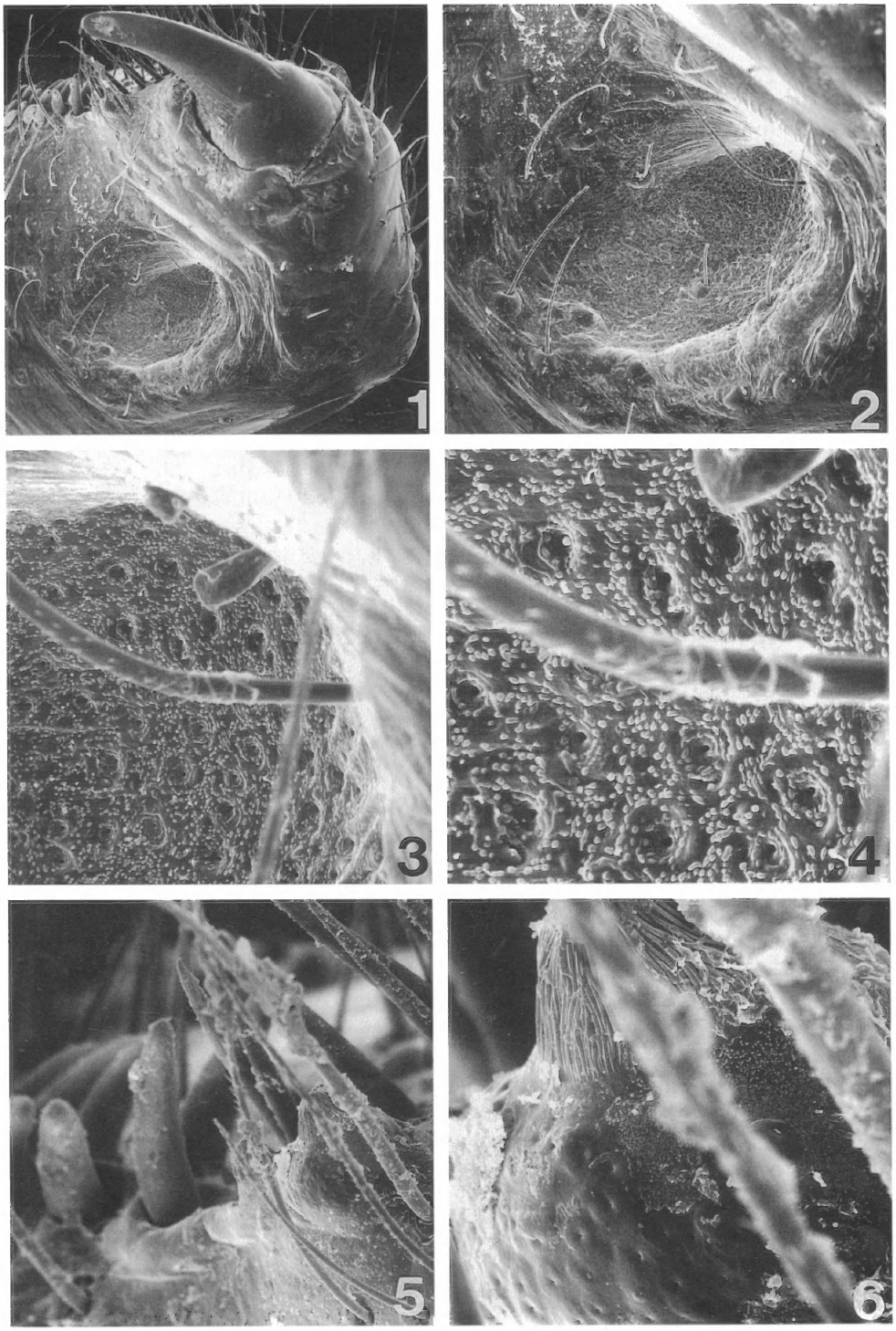
The lateral surface of each chelicera is also bizarrely modified, in both sexes. In addition to a distinct stridulatory file (figs. 7, 8, the accompanying picks for which are three enlarged tubercles situated at the base of the palpal femur), most of the midlength of the most lateral portion of the paturon, anterior to the stridulatory file, is occupied by a long, narrow furrow (figs. 7, 9). The cuticle at the bottom of this furrow is also punctuated by presumptively glandular pores (figs. 9, 10).

Males of *A. stridulans* González from Lima, Peru, show both of these characters, although the posterior cheliceral pit (figs. 11, 12) and the lateral cheliceral furrow (figs. 13, 14) each bears fewer pores than do those of *A. pellucidas*. Light microscope examination of males of *A. gaujoni* Simon from northern Peru indicates that both the pit and furrow occur in that species as well.

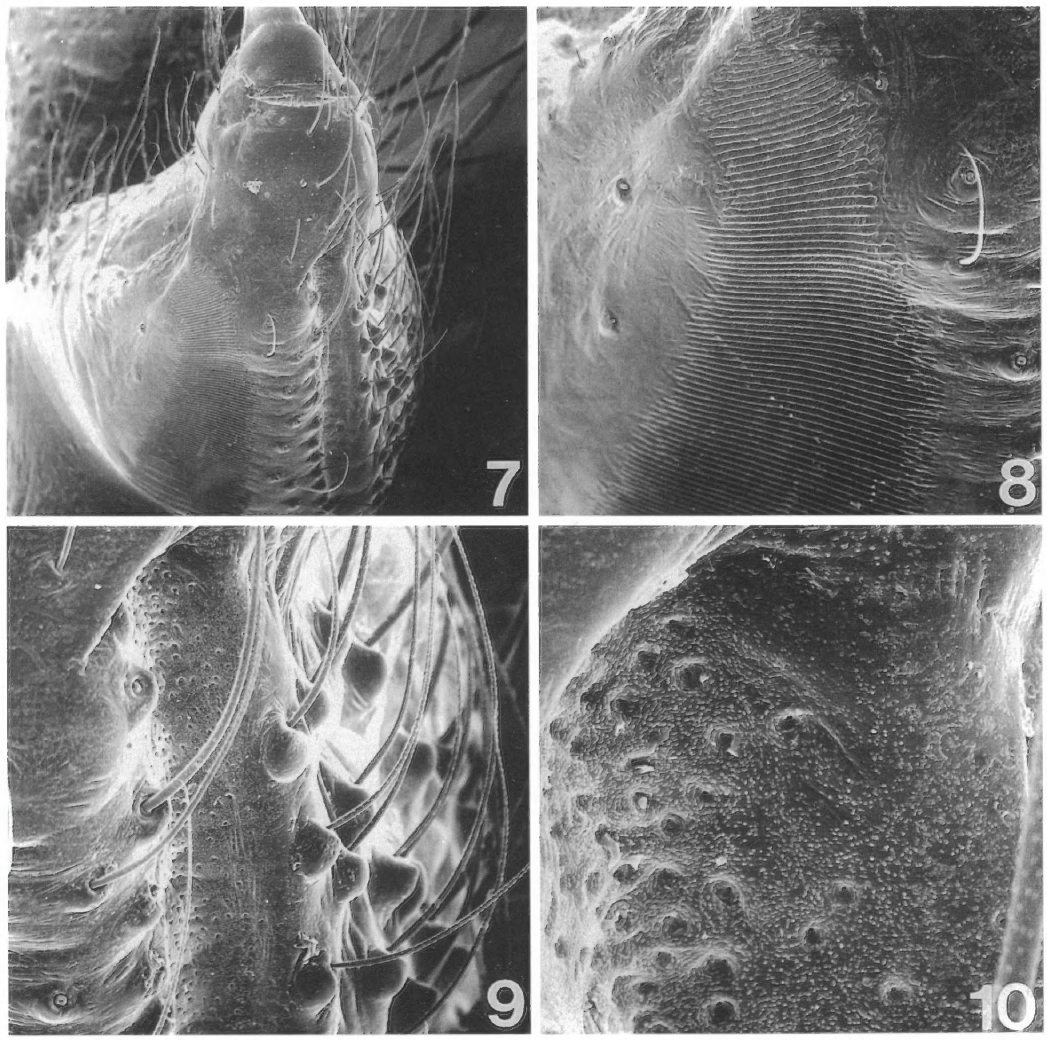
Males of the Argentine species *A. rufus* (Tullgren) also have the cheliceral furrow, which is not known to occur in other otiothopines and thus provides additional evidence for the monophyly of *Anisaedus*. In males of *A. rufus*, however, the cheliceral pit varies widely, ranging from deeply excavated to almost obsolete. The males of *A. rufus* also differ from those of the three western species in lacking strong prolateral tubercles on femora and tibiae I, suggesting that the three western species form a monophyletic group, relative to *A. rufus*. Of the three western species, *A. gaujoni* and *A. stridulans* differ from *A. pellucidas* in having both a triply pointed embolus and a prolateral, tuberculate knob situated near the distal end of femora I in males, again features not found in other otiothopines. We conclude that the interrelationships of the species are therefore: *rufus* (*pellucidas* (*stridulans* + *gaujoni*)). Platnick (1975) considered *A. pellucidas* to be more closely related to *A. rufus* than to the two northern species, based on the presence of a translucent flange on the male embolus in the two southern species, but those structures are of doubtful homology, and similar (although probably not homologous) embolar flanges do occur in some other otiothopines.

Examination of a series of specimens of *A. pellucidas* from the Paposo area of northern Chile indicates that juveniles of both sexes of that species differ from adults in having the dorsal portion of the abdominal scutum separated from the remainder of the scutum by two areas of weakly sclerotized cuticle (as in Platnick, 1975: fig. 79). In adults, the scutum is entire. Hence, the female paratype illustrated by Platnick (1975) is actually a juvenile. The female of *A. rufus* illustrated by Platnick (1975: fig. 72) was also juvenile.

Study of adult females of both of those species reveals a more intricate genitalic arrangement (figs. 15–18). Both species have a



Figs. 1–6. *Anisaedus pellucidas* Platnick, left male chelicera. **1.** Posterior view, showing pit. **2.** Cheliceral pit, posterior view. **3, 4.** Cuticle at bottom of cheliceral pit, showing pores. **5.** Peg teeth, posterior view. **6.** Cheliceral gland mound and associated tooth, posterior view.



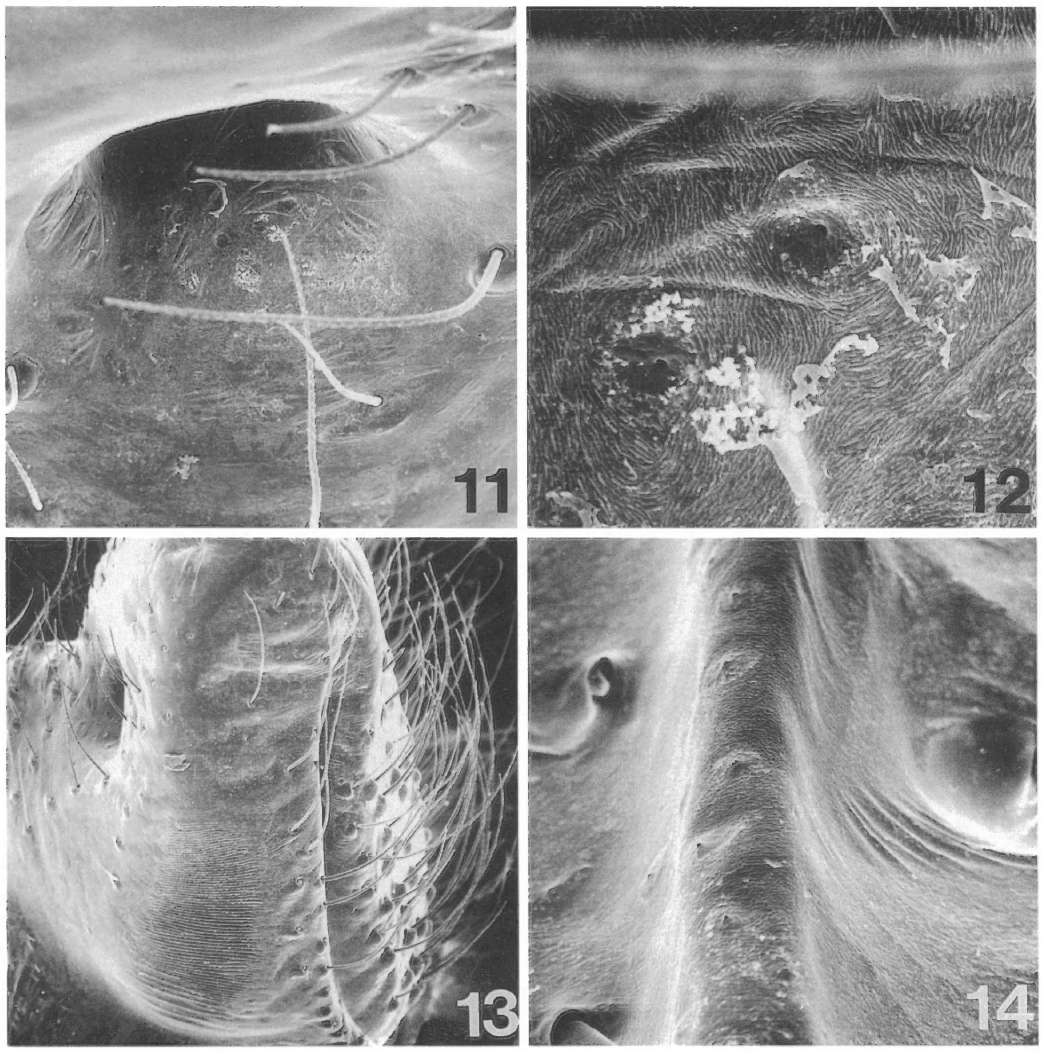
Figs. 7–10. *Anisaedus pellucidas* Platnick, left male chelicera. **7.** Lateral view, showing stridulatory file and lateral furrow. **8.** Stridulatory file, lateral view. **9.** Lateral furrow, lateral view. **10.** Cuticle at bottom of lateral furrow, showing pores.

greatly developed posterior extension of the bursa, in the form of a translucent, membranous sack (not shown in fig. 16). Laterally and posteriorly, at the base of the bursa, there are a few apodemes. The uterus externus is flat, and passes between the posterior extension and the receptacula. The anterior wall of the bursa is heavily sclerotized, and bears one median (in *A. pellucidas*) or two paired (in *A. rufus*) receptacula, densely covered by many filaments of (presumably) secretory glands. There is no definite pore plate, but in *A. pellucidas* there are one or two small, sclerotized receptacula inserting near the tip of the median receptaculum. In both species, the anterior genitalic elements are supported by heavily sclerotized posterolateral projections of the epigastric scutum (fig. 15).

The median tracheae are represented only by the entapophyses, fused into a median lobe; the two lateral tracheae on each side are not ramified (fig. 18). The anterior spinneret entapophyses are fused into a median piece.

Anisaedus gaujoni Simon

Anisaedus gaujoni Simon, 1893: 405, figs. 361, 365 (one male and two female syntypes from



Figs. 11–14. *Anisaedus stridulans* González, left male chelicera. **11.** Cheliceral pit, posterior view. **12.** Cuticle at bottom of cheliceral pit, showing pores. **13.** Lateral furrow, lateral view. **14.** Cuticle at bottom of lateral furrow, showing pores.

Amaluza, Ecuador, not reexamined). – Platnick, 1975: 23, figs. 69–71.

NEW RECORD: PERU: **La Libertad:** Trujillo (MACN), 2♂.

Anisaedus stridulans González
Figures 11–14

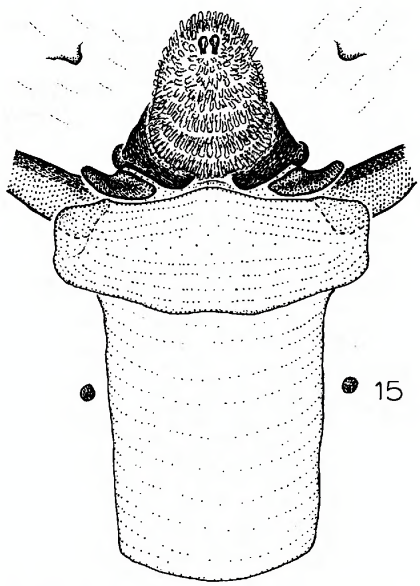
Anisaedus stridulans González, 1956: 76, figs. 1–12 (male holotype and female allotype from Pachacamac, Lima, Peru, destroyed). – Platnick, 1975: 24, figs. 73, 74. – Forster and Platnick, 1984: 76, figs. 288–294.

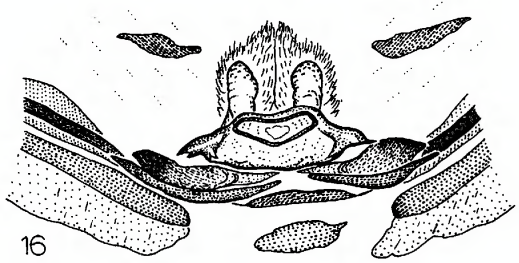
NEW RECORD: PERU: **Lima:** Camp. Kawi, Mala, Jan. 1975, in bungalow (P. Hocking, MUSM), 1♂.

Anisaedus pellucidas Platnick
Figures 1–10, 15, 17

Anisaedus pellucidas Platnick, 1975: 26, figs. 76–79, 81–84 (male holotype from Quebrada de Hueso, E Taltal, Antofagasta, Región de Antofagasta (II), Chile, in AMNH, examined). – Platnick, 1977: 205. – Platnick, 1985: 399.

NEW RECORDS: CHILE: **Región de Antofagasta (II):** *Antofagasta:* 4 km N Paposo, Oct. 11, 1992, elev. 20–50 m (N. I. Platnick,





Figs. 15, 16. Female genitalia, dorsal views. **15.** *Anisaedus pellucidas* Platnick. **16.** *A. rufus* (Tullgren).

K. M. Catley, P. A. Goloboff, AMNH), 1♀; 6 km E Paposo, Oct. 12, 1992, elev. 480 m (N. I. Platnick, K. M. Catley, P. A. Goloboff, AMNH, MACN), 4♂, 4♀. **Región de Atacama (III):** *Chañaral:* Parque Nacional Pan de Azúcar, Oct. 12, 1992 (L. E. Peña G., AMNH), 1♀. *Copiapó:* Caldera, Oct. 4, 1985 (E. A. Maury, MACN 9294), 1♂. *Huasco:* creek leading to Río Huasco, 25 km W Vallenar, Oct. 8, 1992, elev. 170 m (N. I. Platnick, K. M. Catley, P. A. Goloboff, AMNH), 1♂.

Anisaedus rufus (Tullgren)
Figures 16, 18

Compsopus rufus Tullgren, 1905: 26, pl. 2, figs. 6a–e (female holotype from Salta, Salta, Argentina, not reexamined).

Anisaedus argentinus Mello-Leitão, 1942: 390, fig. 3 (male and female syntypes from Luján, Santiago del Estero, Argentina, not reexamined). First synonymized by Platnick, 1975: 25.

Anisaedus rufus: Platnick, 1975: 25, figs. 72, 75.

NEW RECORDS: ARGENTINA: **Catamarca:** Las Palmas, Depto. Capayán, Feb. 1958 (M. E. Galiano, MACN 9292), 1♀. **Formosa:** Ing. Juárez, Oct. 3, 1949 (MACN 9291), 1♀. **Salta:** Tartagal, Mar. 1947 (M. Birabén, MLP), 1♂. **San Juan:** Astica, Apr. 13, 1979 (A. Roig, MACN 9289), 1♂; Las Tumanas, 20 km S Valle Fértil, Apr. 14, 1979 (A. Roig, MACN 9290), 1♂, 1♀. **Santiago del Estero:** Beltrán (MLP), 1♂; Colonia Dora, 1940 (S. A. Prosen, MACN 758), 1♂.

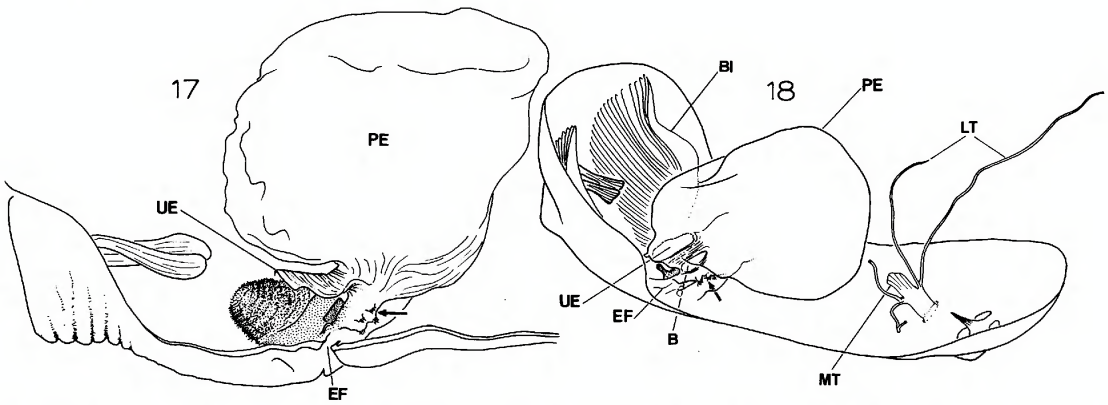
FERNANDEZINA BIRABÉN

This fascinating but little-known genus currently contains five species described by Birabén (1951), Platnick (1975), and Ramírez and Grismado (1996) from Brazil and Argentina. A sixth species described from China is clearly misplaced (see Platnick, 1993: 153). Males are easily recognized by the posteriorly extended abdominal scutum (Platnick, 1975: fig. 80), and both sexes differ from other otiothopines in having unexpanded femora I (Platnick, 1975: fig. 85). We describe here three additional species, including the first one known from Peru. Because of the scarcity of specimens, a detailed examination of the female genitalia has been possible only for one of these species.

Fernandezina tijuca
Ramírez and Grismado

Fernandezina tijuca Ramírez and Grismado, 1996: 117, figs. 1–2 (male holotype from Parque Nacional da Tijuca, Rio de Janeiro, Brazil, not reexamined).

NEW RECORD: BRAZIL: **Rio de Janeiro:**



Figs. 17, 18. Female genitalia, lateral views; arrows point to apodemes. **17.** *Anisaedus pellucidas* Platnick. **18.** *A. rufus* (Tullgren).

Praia Vermelha, Oct. 28, 1990 (A. Kury, MZUSP 11.907), 1♂.

Fernandezina maldonado, new species
Figures 19–21

TYPE: Male holotype taken from litter at a site 15 km E of Puerto Maldonado, Madre de Dios, Peru, 12°33′S, 69°03′W, elev. 200 m (July 10, 1989; J. Ashe, R. Leschen), deposited in MUSM.

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: This taxon appears to be the sister species of *F. pelta* Platnick, sharing with it many details of embolus shape (including the presence of a basal ledge otherwise found only in *F. pulchra* Birabén), but differs in having a proportionately smaller palpal bulb and a longer, more sinuous embolus (figs. 19–21). The unsclerotized portions of the abdominal dorsum are distinctly chevroned, whereas in *F. pelta* the dorsum is entirely darkened and in *F. pulchra* the dorsum has only vague indications of dark markings.

MALE: Total length 2.48. Carapace 1.24 long, 0.89 wide. Femur I 1.04 long, 0.23 high. Posterior median eyes separated by more than twice their diameter. Sclerotized portions of body reddish brown; abdominal scutum covering about three-fifths of dorsum, dorsum with about six dark, transverse chevrons on creamy background, chevrons visible even under scutum, extending ventrally to point halfway between sides and midline. Palpal femur thickened ventrally at middle, tibia globose but much smaller than palpal bulb; bulb relatively small, embolus with large basal ledge, prolaterally directed extension at about two-thirds its length, and long, sinuous tip (figs. 19–21).

FEMALE: Unknown.

OTHER MATERIAL EXAMINED: Two males taken in a Berlese sample at the same site on June 19, 1989 (R. Leschen, MUSM, AMNH).

DISTRIBUTION: Known only from the type locality in eastern Peru.

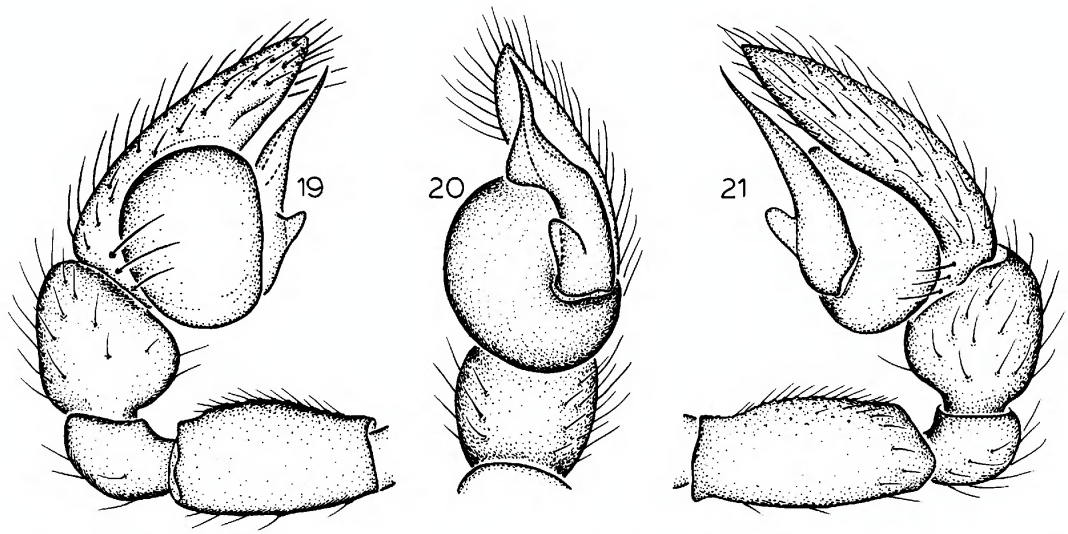
Fernandezina ilheus, new species
Figures 22–24

TYPE: Male holotype taken in a cocoa plantation at Ilhéus, Bahia, Brazil (Aug. 1996; A. N. Andersen), deposited in MNRJ courtesy of the collector and T. Churchill.

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: Males of this distinctive species can easily be recognized by the proximal origin of the palpal embolus (figs. 22–24).

MALE: Total length 2.46. Carapace 1.20 long, 0.92 wide. Femur I 1.09 long, 0.26 high. Posterior median eyes separated by almost twice their diameter. Sclerotized portions of body reddish brown; abdominal scutum covering about three-fifths of dorsum, dorsum dark purple with scattered small, creamy spots, purple pigment extending ventrally to point halfway between sides and midline. Palpal femur not thickened, but ven-



Figs. 19–21. *Fernandezina maldonado*, new species. **19.** Left male palp, prolateral view. **20.** Same, ventral view. **21.** Same, retrolateral view.

tral surface highly tuberculate, tibia enlarged, almost as long as cymbium; bulb relatively small but greatly extended into narrow neck forming base of proximally originating embolus (figs. 22–24).

FEMALE: Unknown.

OTHER MATERIAL EXAMINED: Only a juvenile taken with the holotype.

DISTRIBUTION: Known only from the type locality.

Fernandezina dasilvai, new species
Figures 25–31

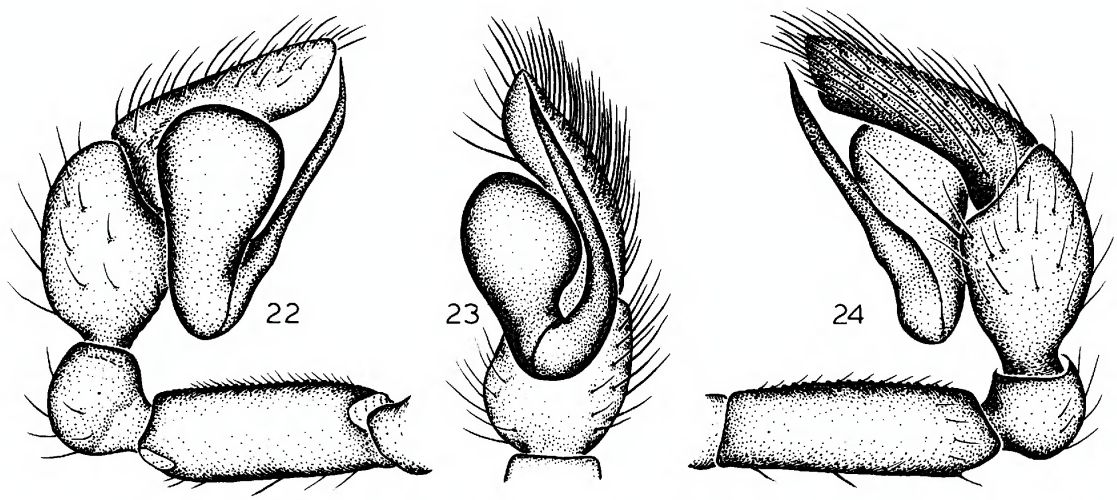
TYPES: Male holotype and female allotype collected from moist leaf litter in secondary forest, with a Moczarski-Tullgren extractor (Wheeler and McHugh, 1987), at Enseada das Palmas, Ilha Grande, Rio de Janeiro, Brazil (Feb. 2–12, 1997; M. Ramírez), deposited in MNRJ.

ETYMOLOGY: The specific name is a patronym in honor of Jose Rodolfo da Silva, who provided inestimable help with fieldwork.

DIAGNOSIS: Males and females can be distinguished by the presence of claw tufts on tarsi II–IV and a tiny tooth near the base of the lateral ridge on the cheliceral paturon. Males are easily distinguished by the relatively short abdominal scutum, which occupies less that half the abdominal length (fig. 25). This species may be basal within the genus (if loss of the claw tufts unites the other members) or closest to *F. tijuca*, but males differ by the less pointed and almost straight tip of the embolus (figs. 29–31) and the distinctly chevroned abdomen.

MALE: Total length 1.98. Carapace 1.00 long, 0.72 wide. Femur I 0.92 long, 0.22 high. Posterior median eyes separated by almost their diameter. Paturon with lateral ridge not well marked, with tiny basal tooth at one-fifth its length. Sclerotized portions of body orange; abdominal scutum covering about 40% of dorsum, unsclerotized portion of dorsum with about six dark brown, transverse chevrons on yellowish background (fig. 25), venter uniformly yellowish. Palpal femur not thickened, tibia globose, larger than bulb; bulb small, embolus almost straight, long, parallel to cymbium in ventral view (figs. 29–31). Tarsi II–IV with claw tufts composed of spatulate hairs.

FEMALE: Total length 2.30. Carapace 0.98 long, 0.74 wide. Femur I 0.94 long, 0.24 high. Posterior median eyes as in male. Chelicerae as in male, but with anterior lateral tooth blunt. Abdominal scutum small, entire; two slender, sclerotized lateral patches behind epigastric furrow. Abdominal pattern as in male, but on greenish blue background (but see below). Female internal genitalia composed of large, paired, globose, dorsally



Figs. 22–24. *Fernandezina ilheus*, new species. **22.** Left male palp, prolateral view. **23.** Same, ventral view. **24.** Same, retrolateral view.

directed median receptacula, with flat posterior extension of bursa bearing apodemes (figs. 26–28); each median receptaculum with basal posterior lobe, sclerotized pore plate situated in depression, and posterior wall covered with small pores; uterus externus directed backward, below median receptacula. Median tracheae represented only by entapophyses, not fused to each other; four lateral tracheae on each side, not ramified. Anterior spinneret entapophyses partially fused at base (fig. 26).

VARIATION: The greenish blue or yellowish coloration of the unsclerotized portion of abdomen varies among specimens.

OTHER MATERIAL EXAMINED: One male, one female, and two juveniles taken with the types (MACN 9563), and three females taken at the same locality, Jan. 25, 1996 (M. Ramírez, MACN 9564).

DISTRIBUTION: Known only from the Atlantic forests of Ilha Grande, Rio de Janeiro, Brazil.

Fernandezina pulchra Birabén
Figures 32, 33

Fernandezina pulchra Birabén, 1951: 546, figs. 1–3 (male holotype from Laguna Yema, Formosa, Argentina, in MACN, examined).

DIAGNOSIS: This species is very similar to both *F. pelta* and *F. maldonado*, but differs by having larger posterior median eyes, separated by about their diameter, and by the proportionately longer distance between the basal ledge and the base of the embolus. The abdomen lacks chevrons.

MALE: Described and figured by Birabén (1951).

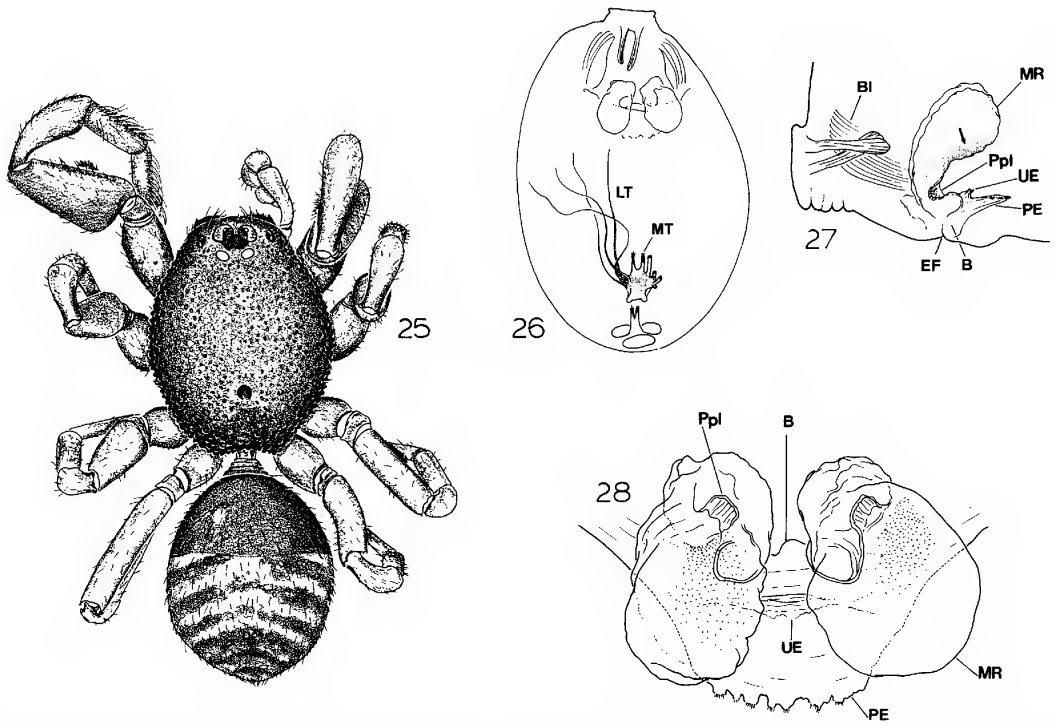
FEMALE: Unknown.

NOTE: The holotype lacks the left palp and both chelicerae.

OTIOTHOPS MACLEAY

We describe here a new species (*O. atlanticus*) from the Atlantic forests of Bahia, Brazil, that has the most bizarre genitalia of any known otiothopine. The male palpal tibia is greatly enlarged, in a form similar to that of the oonopid genus *Opopaea* Simon, and the male palpal bulb is enormously elongated, forming a sickle-shaped structure with one tip sharply pointed; from the opposite tip, a threadlike embolus arises that extends the full length of the bulb (figs. 50–52). Females have a distinctive u-shaped sclerotization posterior to the epigastric scutum (fig. 47); internally, there are long, coiled copulatory ducts (fig. 48).

Both the contiguous posterior median eyes and the presence of claw tufts suggest that this species is more closely related to typical *Otiothops* than to any other palpimanid genus. The question that arises is the same as that involved in placing any highly autapo-



Figs. 25–28. *Fernandezina dasilvai*, new species. **25.** Male, dorsal view. **26.** Female abdomen, KOH digested, dorsal view. **27.** Female internal genitalia, KOH digested, lateral view (arrow pointing to small pores). **28.** Same, dorsal view.

morphic taxon. Does this species represent the sister group of all other members of *Otiothops*, or is it just an extremely autapomorphic member of some subgroup of *Otiothops*?

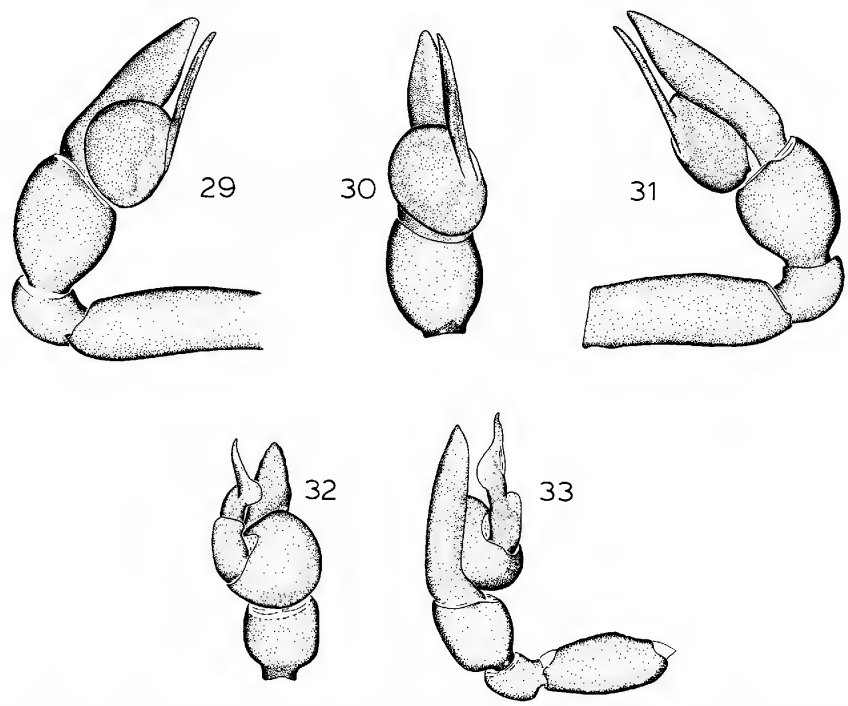
No other members of *Otiothops* have male palpi closely resembling the bizarre structures of this species. Females of some *Otiothops* species do have a sclerotization posterior to the epigastric scutum that could represent a precursor of the large sclerite found in *O. atlanticus*, and among those species the Brazilian species *O. recurvus* Platnick may resemble *O. atlanticus* in having long and coiled copulatory ducts within the female genitalia (see Platnick, 1976: fig. 4). Moreover, *O. recurvus* shares with *O. atlanticus* the presence of spicules on at least metatarsus I of males, and of an unusually elongate male embolus. We conclude that *O. atlanticus* and *O. recurvus* are sister taxa. Until such time as a synapomorphy can be found linking all the remaining species of *Otiothops*, it seems best to consider *O. atlanticus* and *O. recurvus* as just (presumably highly autapomorphic) members of *Otiothops*.

The pores on the stem of the female copulatory ducts may be homologous with those on the pore plate found in the median receptacula of other palpimanids. At least in *Otiothops birabeni* Mello-Leitão (examined by M. Ramírez), each pore on the pore plate has a conical shaft, as in *O. atlanticus*. If so, the stem and proximal part of copulatory ducts (and perhaps one pair of the spherical receptacles) could be homologous with the median receptacula. The presumptively glandular tubes on the posterior wall of the bursa are present also in *O. birabeni*, as are the apodemes. Interestingly, *O. birabeni* also has two spherical receptacles with rather long ducts (Brescovit and Bonaldo, 1993: fig. 4).

Otiothops atlanticus, new species

Figures 34–52

TYPES: Male holotype and female allotype taken in an abandoned cocoa plantation at



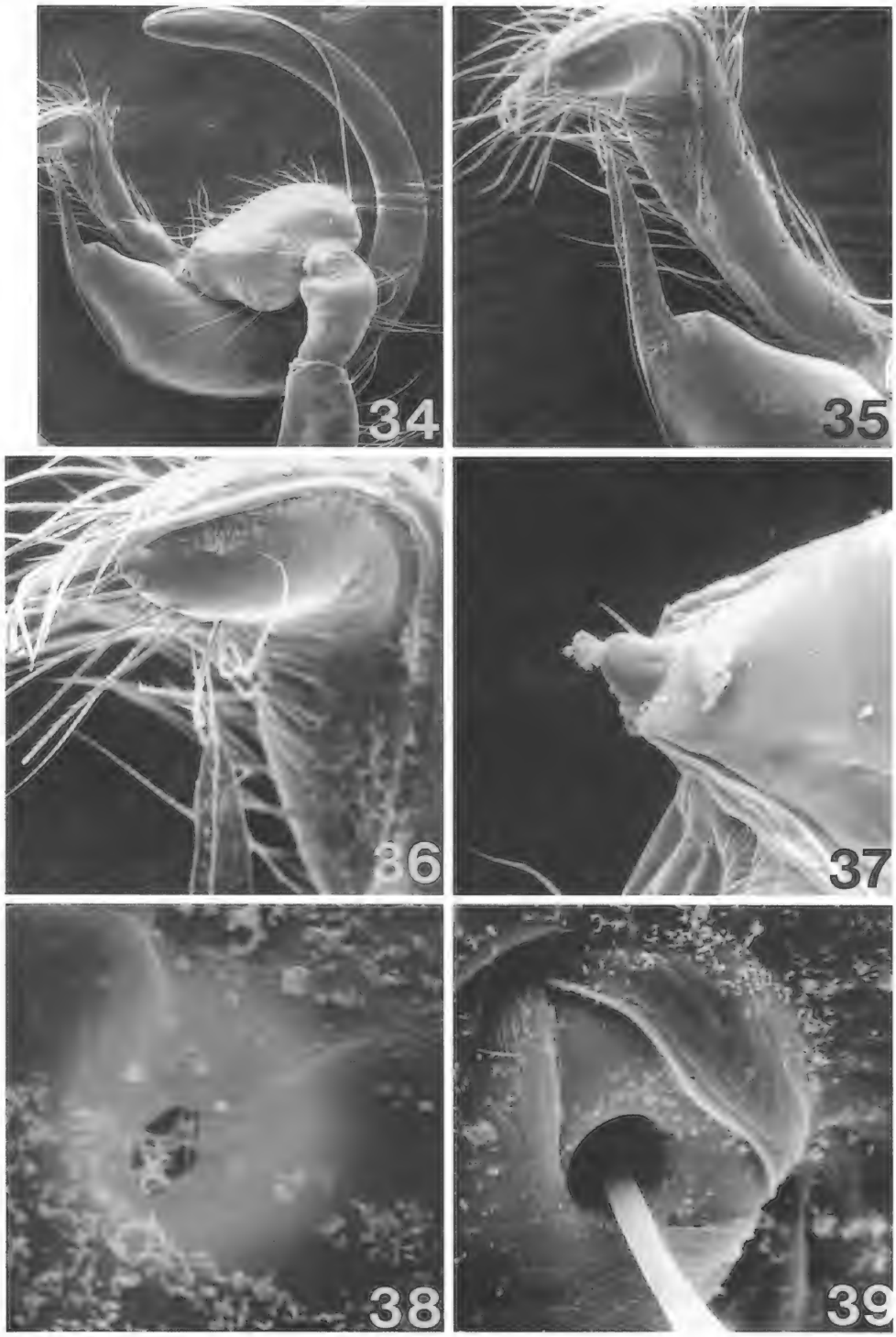
Figs. 29–33. 29–31. *Fernandezina dasilvai*, new species. 32, 33. *Fernandezina pulchra* Birabén. **29.** Left male palp, prolateral view. **30.** Same, ventral view. **31.** Same, retrolateral view. **32.** Right male palp of holotype, ventral view. **33.** Same, retrolateral view.

Itabuna, Bahia, Brazil, 14°38′S, 39°18′W, elev. ca. 100 m (Jan. 26, 1995; D. Agosti), deposited in MNRJ.

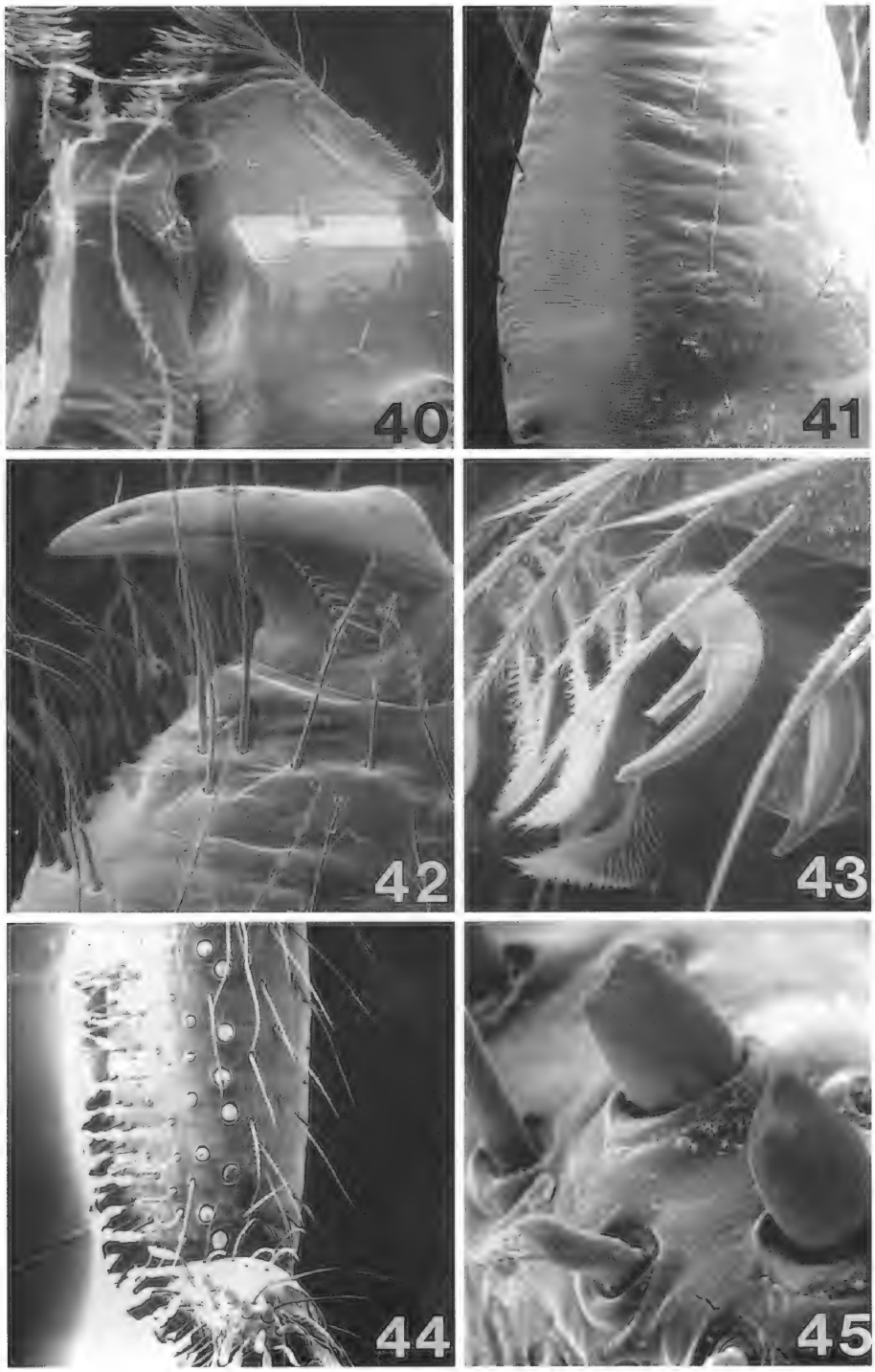
ETYMOLOGY: The specific name refers to the habitat of the species in the endangered Atlantic forests of Brazil.

DIAGNOSIS: The enormously elongated male palpal bulb and filiform embolus (figs. 50–52), and the elaborate female copulatory ducts (figs. 48), are diagnostic.

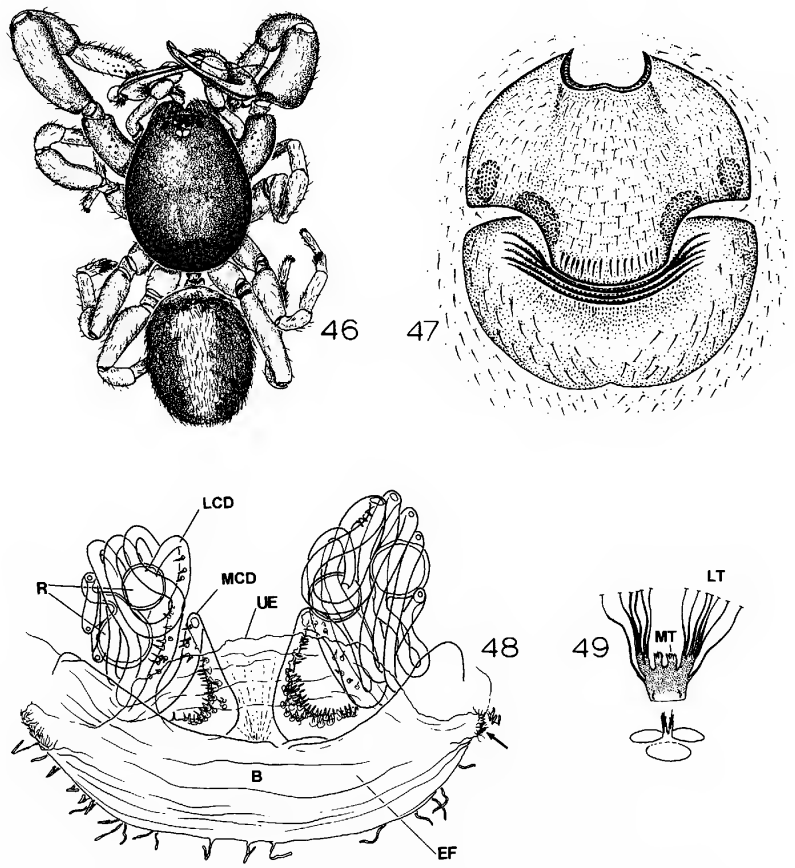
MALE: Total length 2.97. Carapace 1.49 long, 1.12 wide. Femur I 0.92 long, 0.47 high. Carapace oval in dorsal view, widest at coxae II, gradually narrowed toward front, deep reddish orange, entire surface covered with seta-bearing tubercles (fig. 46). Thoracic groove a deep, v-shaped pit, pars cephalica greatly elevated. Eyes closely clustered, occupying only about half of carapace width at level of lateral pairs; from above, anterior row slightly recurved, posterior row strongly procurved; from front, anterior row procurved, posterior row strongly procurved; posterior row slightly wider than anterior; anterior median eyes largest, dark, circular, laterals smallest, light, oval, posterior medians opalescent, irregularly triangular; anterior medians separated by their radius, by same distance from anterior laterals; posterior medians contiguous, separated by more than twice their diameter from posterior laterals; anterior and posterior laterals of each side almost contiguous. Median ocular quadrangle much wider in front than in back, about as long as wide in front. Clypeal height twice anterior median diameter. Chelicerae short, strong, flattened anteriorly, reddish orange, set in foramen created by sclerotized strip uniting right and left sides of carapace anterior to endites, chilum absent; paturon with distinct anterolateral boss followed proximally by long, longitudinal ridge along sides, anterior to wide stridulatory file (fig. 41); promargin with single tooth and series of long, narrow peg teeth, retromargin with three teeth (fig. 42). Endites short, orange, triangular, convergent, with short, strong serrula (fig. 40). Labium triangular, orange, not tuberculate, distal end with median incision. Sternum shield-shaped, reddish-orange, me-



Figs. 34–39. *Otiothops atlanticus*, new species, male. **34.** Right palp, prolateral view. **35, 36.** Same, showing cymbial depression. **37.** Stridulatory tubercle on palpal femur, prolateral view. **38.** Tarsal organ, leg IV, dorsal view. **39.** Trichobothrial base, metatarsus II, dorsal view.

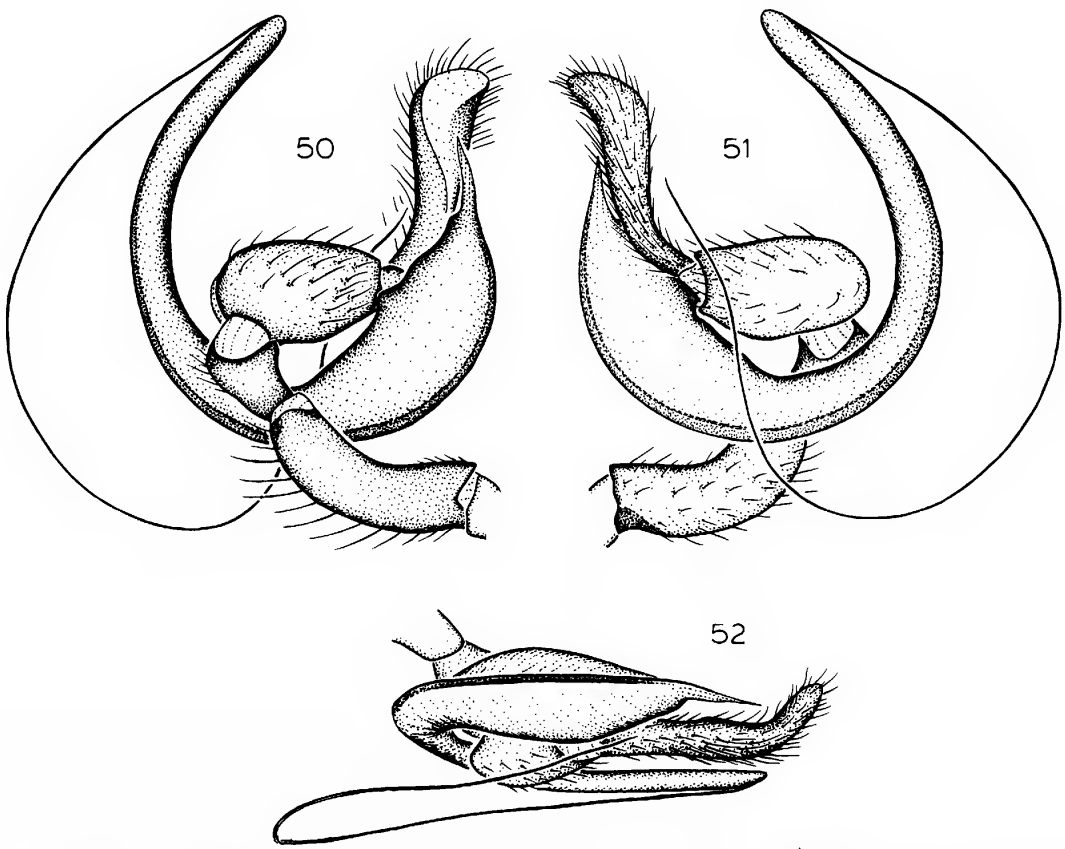


Figs. 40–45. *Otiothops atlanticus*, new species, male. **40.** Labrum and endite, anterior view, showing serrula. **41.** Cheliceral stridulatory file. **42.** Left chelicera, posterior view, showing gland mound. **43.** Tarsus III, distal view, showing claw tufts. **44.** Leg I, ventral view, showing spicules. **45.** Metatarsus I, ventral view, showing spicules.



Figs. 46–49. *Otiothops atlanticus*, new species. **46.** Male, dorsal view. **47.** Female epigastric region, ventral view. **48.** Female genitalia, KOH digested, dorsal view; arrow points to apodemes on posterior wall of bursa. **49.** Tracheae and base of spinnerets, KOH digested, dorsal view.

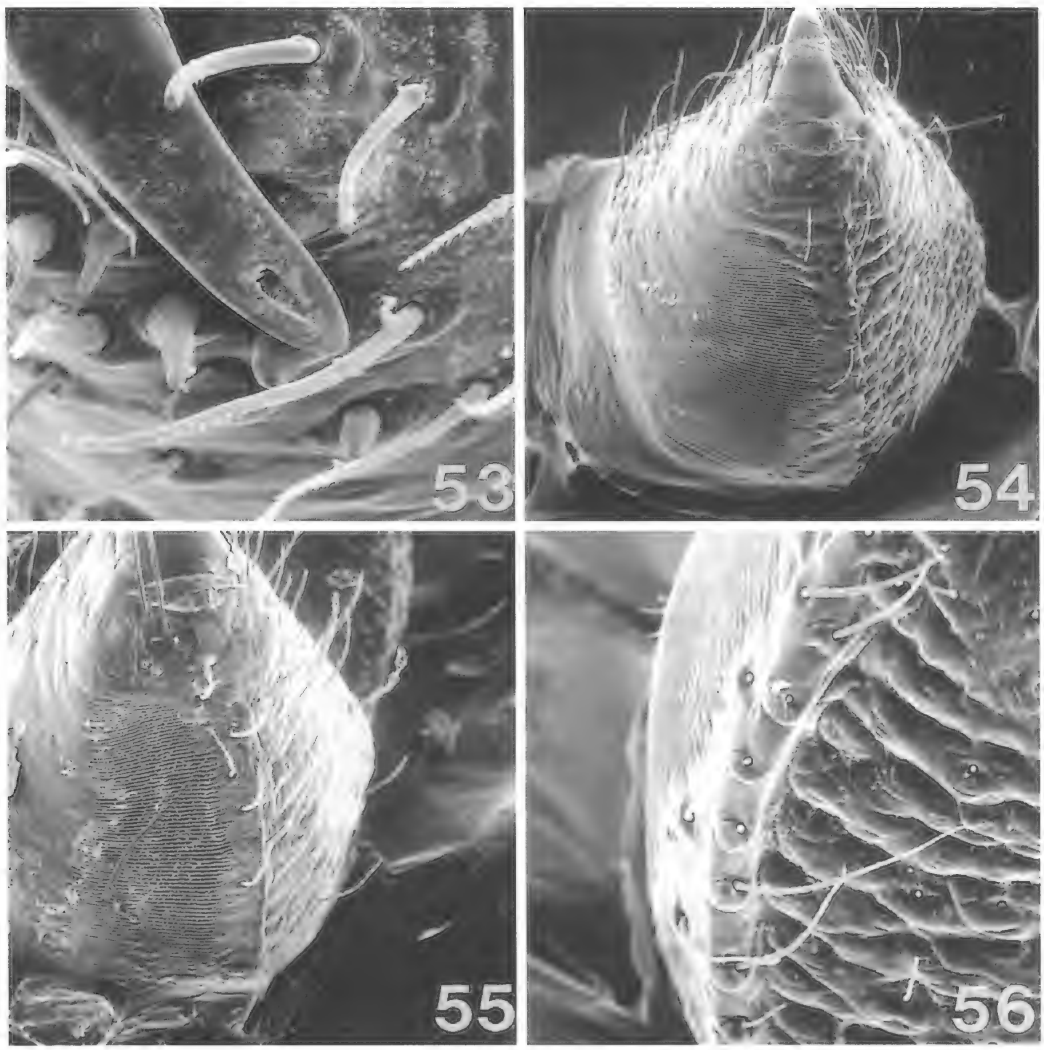
dially with seta-bearing pits, sides with about four rows of large, seta-bearing tubercles; sclerotized extensions surround coxae II–IV. Abdomen brownish purple with anterior ring-shaped scutum (entire in adults), dorsum distinctly paler along midline than at sides; venter light yellow. Tracheal spiracle situated well in advance of spinnerets. Two spinnerets, anterior laterals two-segmented, distal segment much shorter, narrower than basal segment; without traces of other spigots; colulus absent. All legs devoid of spines, but male tibia I with two ventral rows of black spicules (resembling those of tracheline corinnids), metatarsus I with 3–5 similar spicules (figs. 44, 45). Leg I enlarged, orange, other legs yellow; coxae I, IV with dorsal tubercles; femur I greatly expanded dorsally; patella I elongated, metatarsus I greatly shortened; tibia I with lateral scopula represented only by sparse patch of well-separated setae; metatarsus and tarsus I with distinct lateral scopulae originating from well delimited patches of unsclerotized cuticle; tarsus I originating from retrolateral surface of metatarsus I. Tarsi with two dentate claws (reduced in size on leg I), protruding onychium, and claw tufts (fig. 43). Tarsal organ capsulate (fig. 38), trichobothrial bases capped (fig. 39). Palpal femur with stridulatory pick composed of single tubercle situated prolaterally, at base of segment (fig. 37). Palp with enlarged tibia; cymbium narrow, especially at base, sinuous; palpal bulb originating at base of cymbium, enormously expanded into sickle-shaped structure bearing sharp point near apex of cymbium; opposite end of bulb rounded, giving rise to threadlike embolus extending back full length of bulb (figs. 34–36).



Figs. 50–52. *Otiothops atlanticus*, new species. **50.** Left male palp, prolateral view. **51.** Same, ventral view. **52.** Same, retrolateral view.

FEMALE: As in male, except for the following. Total length 3.36. Carapace 1.55 long, 1.09 wide. Femur I 0.94 long, 0.47 high. Several (cylindrical gland?) spigots originating directly from abdominal cuticle between anterior lateral spinnerets and anal tubercle. Spicules present only on metatarsus I. Palp without claw. Post-epigastric u-shaped sclerite situated immediately behind epigastric scutum (fig. 47). Internal genitalia (fig. 48) with heavily sclerotized piece on anterior wall of bursa, from which originate four long, coiled copulatory ducts, leading to spherical receptacula; each pair of ducts arising from common stem, covered by numerous pores, with one conical (presumably) glandular shaft each; pores occurring also on proximal part of each copulatory duct; median copulatory ducts much longer, more coiled than laterals; median receptacula absent; uterus externus flat, anteriorly directed, passing over base of copulatory ducts; posterior wall of bursa slightly extended posteriorly, with apodemes at each corner, and several scattered, very thin (presumably) glandular tubes. Median tracheae represented only by entapophyses, not fused to each other; 6–7 lateral tracheae on each side, some of them bifurcating (fig. 49). Anterior spinneret entapophyses partially fused at their bases.

OTHER MATERIAL EXAMINED: BRAZIL: **Bahia:** Ilhéus, Aug. 1996, rainforest (A. N. Anderson, T. Churchill collection), 1♂, 1♀, cocoa plantation (A. N. Anderson, T. Churchill collection), 1♂; Ilhéus, Mata da Esperança, 14°47′2″S, 39°3′45″W, Jan. 29, 1995, Atlantic forest, elev. 50 m (D. Agosti, AMNH), 1♂; Itabuna, 14°38′S, 39°18′W, Jan. 26, 1995, abandoned cocoa plantation, elev. ca. 100 m (D. Agosti, AMNH. MACN), 7♂, 8♀; Una, 15°11′46″S, 39°3′34″W, Jan.



Figs. 53–56. *Notiothops birabeni* (Zapfe), left male chelicera. **53.** Tip of fang, showing peg teeth and cheliceral gland mound, distal view. **54.** Lateral view. **55.** Lateral view, showing stridulatory file and lateral ridge (rather than furrow). **56.** Ridge at edge of stridulatory file, showing accompanying tubercles.

31, 1995, Atlantic forest, elev. 80 m (D. Agosti, AMNH), 1♀; Una Biological Reserve, 15°10′S, 39°03′W, Apr. 13–16, 1998, pitfall (A. D. Brescovit et al., Instituto Butantan IBSP 18128, not seen), 1♀ (Brescovit, pers. commun., not seen).

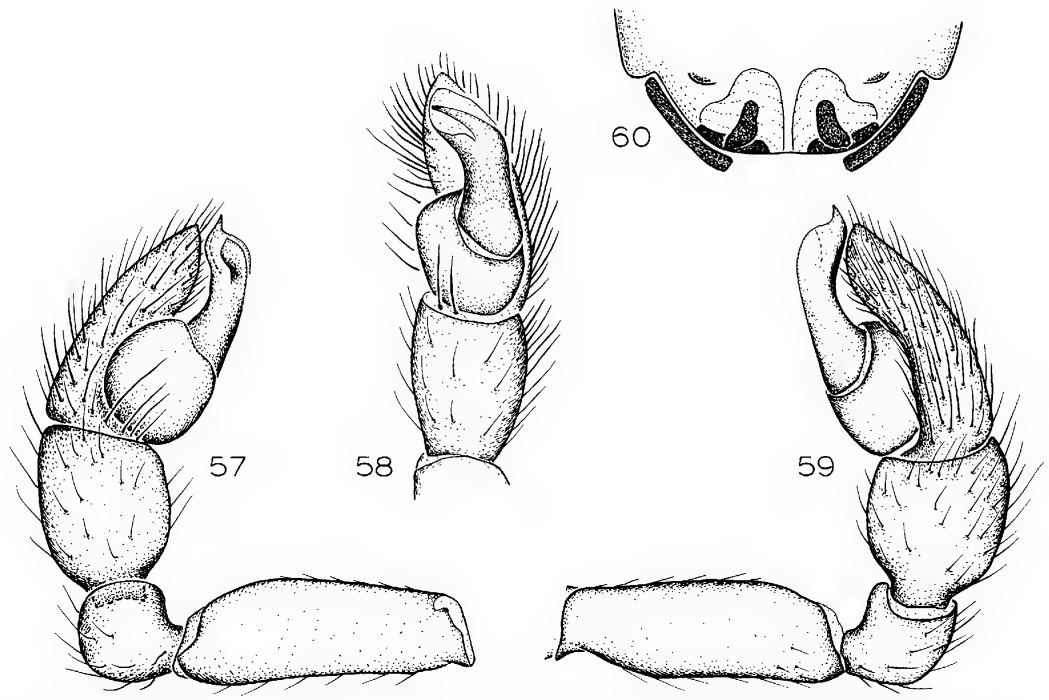
DISTRIBUTION: Known only from the Atlantic forests of Bahia, Brazil.

NOTIOTHOPS, NEW GENUS

TYPE SPECIES: *Notiothops noxiosus*, new species.

ETYMOLOGY: The generic name is a contraction of not and *Otiothops*, and (like all generic names ending in -ops) is masculine in gender.

HISTORY: When the otiothopines were first revised by Platnick (1975), only one palpimanid had been described from Chile, namely *Fernandezina birabeni* Zapfe (1961). No specimens of that animal were available for study, however, and little could then be said about it, beyond the observation that the absence of an elongated abdominal scutum in males made it unlikely that the species was correctly placed in *Fernandezina*. When



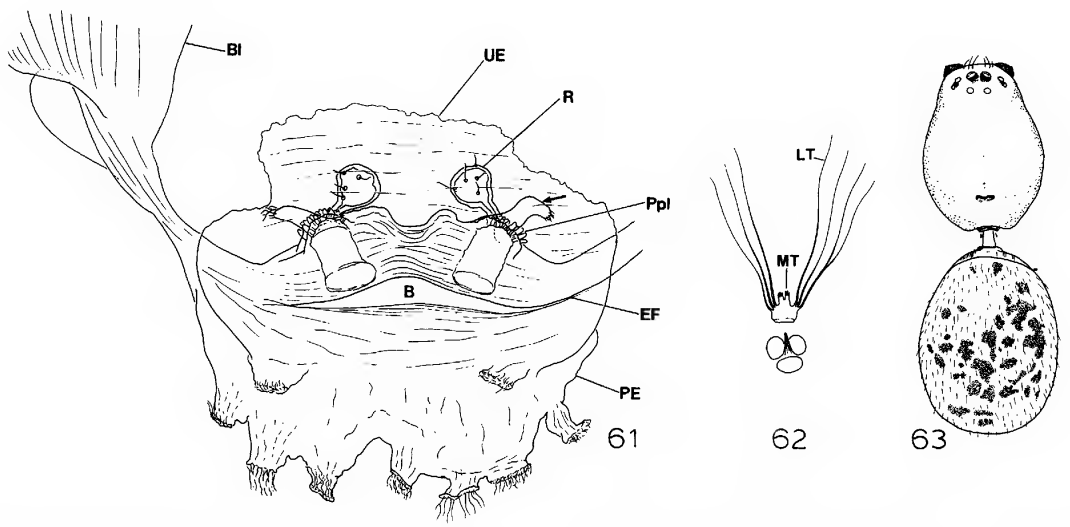
Figs. 57–60. *Notiothops noxiosus*, new species. **57.** Left male palp, prolateral view. **58.** Same, ventral view. **59.** Same, retrolateral view. **60.** Female genitalia, dorsal view.

specimens later became available, Platnick (1977) transferred the species to *Otiothops*, where it required a new name because the combination *Otiothops birabeni* was preoccupied. Platnick noted that the widely separated posterior median eyes and reduced claw tufts of the species were atypical for *Otiothops*. Because the male palp showed some similarities to those of the *amazonicus* group of *Otiothops*, Platnick opted to enlarge the generic concept of *Otiothops*, and therefore presented a revised key to genera. Subsequently, a closely related species was described as *Otiothops maulensis* by Platnick (1985).

In retrospect, the enlargement of the concept of *Otiothops* appears unfortunate. Several additional species with the same combination of characters are now known (see below), and although the number of specimens available is still small, it is clear that these Chilean taxa do not belong to *Otiothops*. As with most other groups of spiders that have radiated within Chile, these austral taxa do not appear to be congeneric with any of their relatives from more tropical parts of South America. Indeed, these taxa may not even represent the sister group of true *Otiothops*; if an increased number of lateral tracheae is apomorphic, as seems likely, *Otiothops* is probably more closely related to *Fernandezina* than to these Chilean taxa.

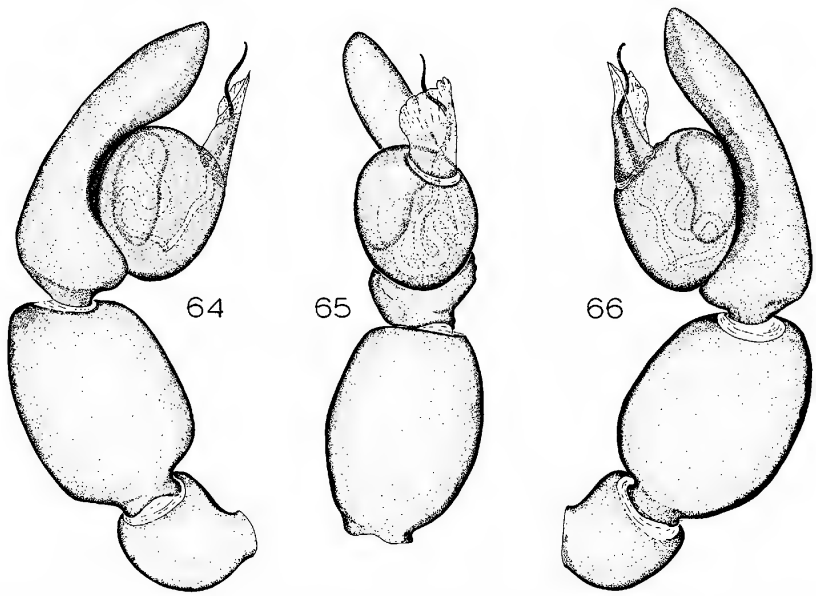
DIAGNOSIS: In lacking claw tufts and having widely separated posterior median eyes, these species resemble *Anisaedus* and *Fernandezina* rather than *Otiothops*. They can easily be separated from those of *Fernandezina* by the dorsally expanded femora I, and from those of *Anisaedus* by the absence of posterior recurved elevations on the sternum and of a lateral furrow on the chelicerae. The asymmetrical abdominal pigmentation pattern may also be diagnostic.

DESCRIPTION: Total length 2.9–5.5. Carapace longer than wide, oval in dorsal view, widest between coxae I and II, abruptly narrowed toward front, reddish orange, with tubercles largely restricted to lateral and posterior margins. Thoracic groove a deep, transverse pit, pars cephalica greatly elevated. Eyes widespread, occupying about two-thirds of carapace width at level of lateral



Figs. 61–63. *Notiothops huaquen*, new species. **61.** Internal female genitalia, KOH digested, dorsal view (arrow points to sclerotized projection). **62.** Tracheae and base of spinnerets, KOH digested, dorsal view. **63.** Male carapace and abdomen, dorsal view.

pairs; from above, anterior row slightly recurved, posterior row strongly procurved; from front, anterior row procurved, posterior row strongly procurved; posterior row slightly wider than anterior; anterior median eyes largest, dark, circular, laterals smallest, light, oval, posterior medians opalescent, circular; anterior medians separated by almost their diameter, by same distance from anterior laterals; posterior medians separated by twice their diameter, by three times their diameter from posterior laterals; anterior and posterior laterals of each side almost contiguous. Median ocular quadrangle slightly wider in back than in front, longer than wide in front. Clypeal height more than twice anterior median diameter. Chelicerae short, strong, flattened anteriorly, reddish orange, set in foramen created by sclerotized strip uniting right and left sides of carapace anterior to endites, chilum absent; paturon without distinct anterolateral boss, with long, longitudinal ridge extending entire length of sides (fig. 54), ridge situated anterior to wide stridulatory file (fig. 55), crest of ridge marked with several tubercles (fig. 56); promargin with series of long, narrow peg teeth (fig. 53), retromargin with three teeth in row set slightly anterior to cheliceral gland mound. Endites short, orange, distally rounded, convergent, with short, strong serrula. Labium triangular, orange, not tuberculate, distal end with median incision. Sternum shield-shaped, reddish-orange, medially with seta-bearing pits, sides with scattered small, seta-bearing tubercles; sclerotized extensions meet but do not fuse with epimeric sclerites surrounding coxae II–IV. Abdomen pale grayish purple with orange anterior ring-shaped scutum (entire in adults of both sexes). Tracheal spiracle situated well anterior to spinnerets; at least in *N. huaquen*, three lateral tracheae present on each side. Two spinnerets, anterior laterals two-segmented, distal segment much shorter, narrower than basal segment; males without traces of other spigots, females with several (cylindrical gland?) spigots originating directly from abdominal cuticle between anterior lateral spinnerets and anal tubercle; colulus absent. All legs devoid of spines, tibia and metatarsus I without spicules, femur and patella I with numerous prolateral tubercles, strong in males, weaker but still present in females. Leg I enlarged, orange, other legs yellow; coxae I, IV with dorsal tubercles; femur I greatly expanded dorsally; patella I elongated, metatarsus I greatly shortened; tibia I with lateral scopula represented only by sparse patch of well-separated setae; metatarsus and tarsus I with distinct lateral scopulae originating from well delimited patches of unsclerotized cuticle; tarsus I orig-



Figs. 64–66. *Notiothops huaquen*, new species, left male palp. **64.** Prolateral view. **65.** Ventral view. **66.** Retrolateral view.

inating from retrolateral surface of metatarsus I. Tarsi with two dentate claws (reduced in size on leg I), protruding onychium, with claw tufts reduced to few setae situated beside onychium. Palpal femur with stridulatory pick composed of single tubercle situated prolaterally, at base of segment; female palp without claw. Male palp with femur short, laterally compressed; tibia globose, about as large as palpal bulb; bulb with embolus originating at anterior end of retrolateral surface. Female genitalia examined in detail only in *N. huaquen* (see below).

Notiothops noxiosus, new species
Figures 57–60

TYPES: Male holotype taken in litter under vegetation on sand dunes at an elevation of 10 m at Los Molles, km 188 of Ruta 5, Petorca, Región V (Valparaíso), Chile, 32°14′S, 71°30′W (Nov. 13, 1993; N. I. Platnick, K. M. Catley, M. J. Ramírez, R. T. Allen), and female allotype taken at the same site (Nov. 9, 1993), deposited in AMNH.

ETYMOLOGY: The specific name refers to the effects, on collector's skin, of the noxious vegetation these animals live under at the type locality.

DIAGNOSIS: Males can be distinguished from those of *N. huaquen* (also from Petorca) by the longer and more obliquely directed embolus (figs. 57–59), females by the narrow spermathecae (fig. 60).

MALE: Total length 3.87. Carapace 1.89 long, 1.23 wide. Femur I 1.28 long, 0.62 high. Abdominal scutum reaching just beyond anterior edge of dorsum, unsclerotized portion of dorsum with purplish pigment sparse along midline. Embolus with large, obliquely directed sclerotized portion accompanied distally by more membranous lobe (figs. 57–59).

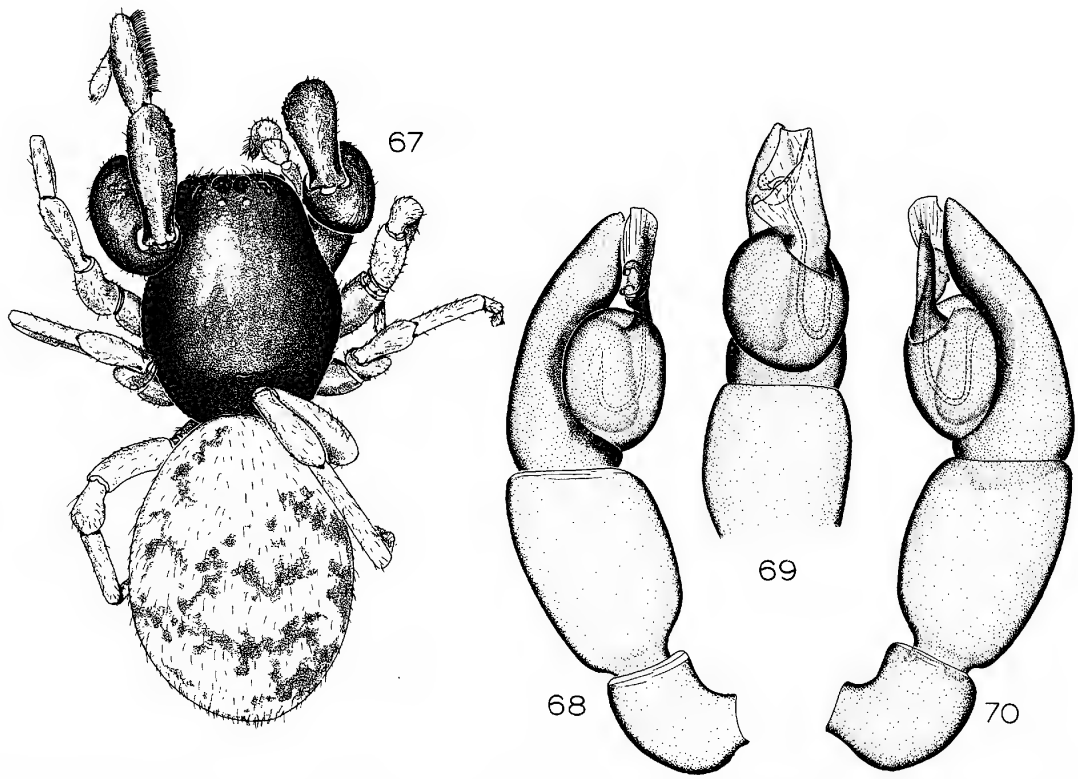
FEMALE: Total length 5.41. Carapace 2.08 long, 1.55 wide. Femur I 1.65 long, 0.78 high. Abdominal scutum entire but restricted to ventral half of anterior surface; dorsum with only few scattered patches of purple pigment. Spermathecae (under gross dissection only) short, narrow (fig. 60).

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Known only from Petorca, Chile.

Notiothops huaquen, new species
Figures 61–66

TYPES: Male holotype from Quebrada Huaquén, Pichicuy, Petorca, Región V (Valparaíso), Chile (Oct. 1988; P. A. Goloboff, E.



Figs. 67–70. *Notiothops campana*, new species, male. **67.** Dorsal view. **68.** Left palp, prolateral view. **69.** Same, ventral view. **70.** Same, retrolateral view.

A. Maury, C. A. Szumik) and female allotype from the same locality (Jan. 1984; P. A. Goloboff), deposited in MACN (9298, 9299, respectively).

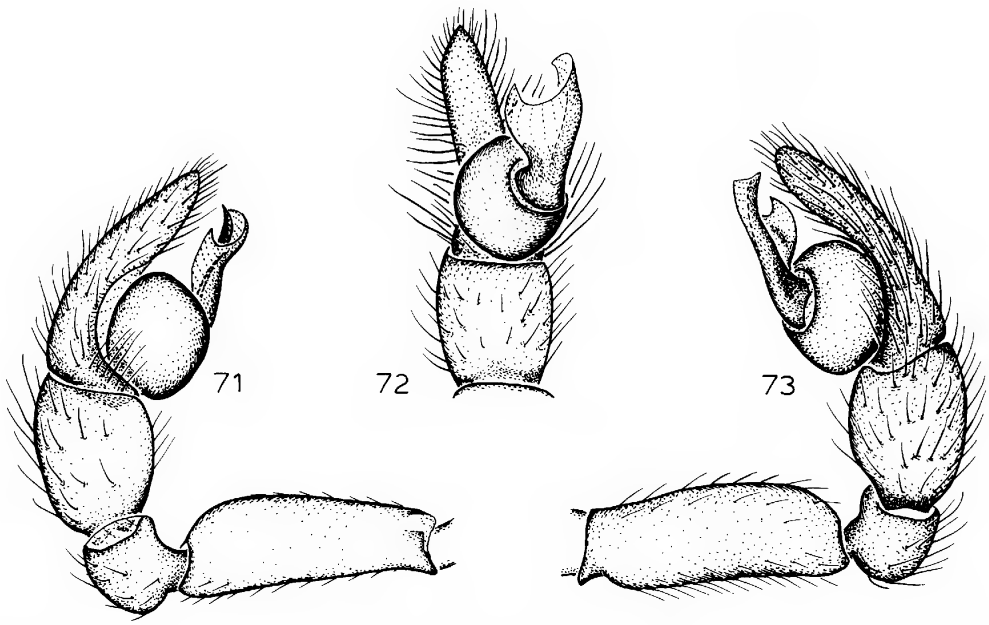
ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: Males can be distinguished from those of *N. noxiosus* (also from Petorca) and all other members of the genus by the much shorter embolus (figs. 64–66), females by the wider internal genitalia (fig. 61).

MALE: Total length 3.30. Carapace 1.41 long, 1.11 wide. Femur I 1.20 long, 0.54 high. Abdominal scutum as in male *N. noxiosus*, abdominal dorsum with as much purple pigment along midline as elsewhere (fig. 63). Palpal cymbium stout, bulb small (figs. 64–66).

FEMALE: Total length 4.03. Carapace 1.89 long, 1.35 wide. Femur I 1.30 long, 0.69 high. Abdominal scutum as in female *N. noxiosus*, abdominal dorsum almost completely covered with patches of purple pigment. Internal genitalia with heavily sclerotized piece on anterior wall of bursa, from which originate two thin ducts leading to spherical receptacula, two lobes bearing pore plate, and two dorsal sclerotized projections with muscle insertions at their free ends (fig. 61). Median receptacula appear to be reduced to cavity below pore plate; each spherical receptaculum with few sparse pores bearing glands. Uterus externus flat, anteriorly directed, passing over receptacles. Bursa with flat posterior extension bearing several apodemes. Median tracheae represented only by entapophyses, not fused to each other; three lateral tracheae on each side, not ramified (except one, asymmetrical). Anterior spinneret entapophyses fused into single central element (fig. 62).

OTHER MATERIAL EXAMINED: CHILE: **Región V (Valparaíso):** *Petorca:* Quebrada El Tigre, Nov. 14, 1987 (E. A. Maury, MACN 9301, 9302), 2♂, Nov. 7, 1988 (P. A. Goloboff, E. A. Maury, C. A. Szumik, AMNH), 1♂.



Figs. 71–73. *Notiothops penai*, new species, left male palp. **71.** Prolateral view. **72.** Ventral view. **73.** Retrolateral view.

DISTRIBUTION: Known only from Petorca, Chile.

Notiothops campana, new species
Figures 67–70

TYPE: Male holotype from Parque Nacional La Campana, Palmas de Ocoa, Quillota, Region de Valparaiso (V), Chile (Oct. 27–28, 1988; P. Goloboff, E. Maury, C. Szumik), deposited in MACN (9560).

ETYMOLOGY: The specific name in a noun in apposition taken from the type locality.

DIAGNOSIS: Males of this species resemble those of *N. penai*, but have a less widely expanded embolus, not as deeply invaginated distally as in that species (figs. 67–69).

MALE: Total length 3.72. Carapace 1.70 long, 1.30 wide. Femur I 1.32 long, 0.54 high. Abdominal scutum as in male of *N. noxiosus*, abdominal dorsum with scattered grayish-purple pigment on cream background (fig. 67). Sclerotized portion of embolus restricted to retrolateral side of bulb, with two wide translucent flanges forming cavity where sperm duct curves back just before its opening (figs. 68–70).

FEMALE: Unknown.

OTHER MATERIAL EXAMINED: One male paratype taken with the holotype (MACN).

DISTRIBUTION: Known only from type locality.

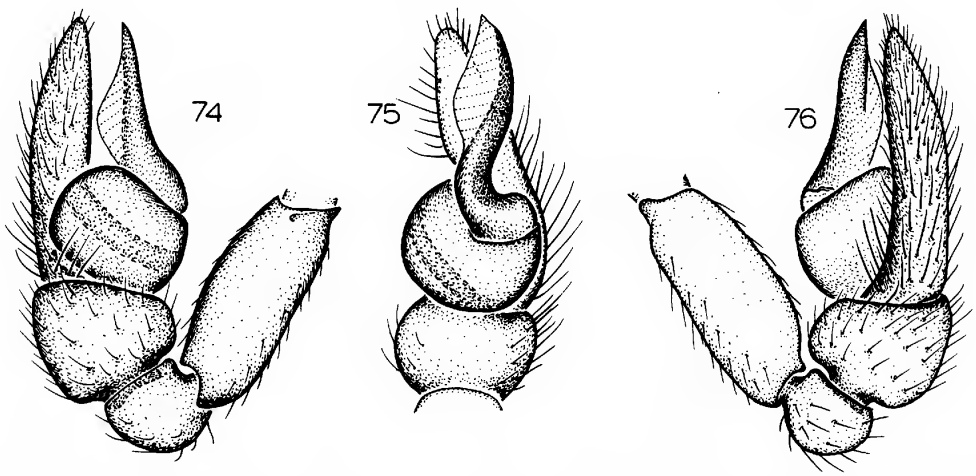
Notiothops penai, new species
Figures 71–73

TYPE: Male holotype from Quebrada de Alvarado, Valparaíso, Región V (Valparaíso), Chile (Aug. 21, 1985; L. E. Peña G.), deposited in AMNH.

ETYMOLOGY: The specific name is a patronym in honor of the late Lucho Peña, leading Chilean naturalist and good friend.

DIAGNOSIS: Males can easily be recognized by the embolus, which bears an extremely wide distal, translucent flange (figs. 71–73), extending farther toward the prolateral side of the bulb than in the similar males of *N. campana*, and has a much deeper distal invagination.

MALE: Total length 3.23. Carapace 1.62 long, 1.22 wide. Femur I 1.22 long, 0.55 high. Abdominal scutum as in male *N. noxiosus*, abdominal dorsum with almost no purple pigment. Sclerotized portion of embolus long, restricted to retrolateral side of bulb,



Figs. 74–76. *Notiothops llolleo*, new species, left male palp. **74.** Prolateral view. **75.** Ventral view. **76.** Retrolateral view.

distal translucent flange greatly widened (figs. 71–73).

FEMALE: Unknown.

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Known only from Valparaíso, Chile.

Notiothops llolleo, new species
Figures 74–76

TYPE: Male holotype taken from moss at San Juan de Llolleo, San Antonio, Región V (Valparaíso), Chile (May 1983; M. Lewin), deposited in MNHNS.

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: The very long embolus of males resembles that of *N. birabeni*, but is greatly curved near its base, rather than at about half its length (figs. 74–76; cf. Platnick, 1977: figs. 1, 2).

MALE: Total length 2.90. Carapace 1.32 long, 1.01 wide. Femur I 0.99 long, 0.47 high. Abdominal scutum as in male *N. noxiosus*, abdominal dorsum with scattered purple pigment. Embolus long, strongly sinuous near base, with translucent flange widest at about two-thirds of embolar length (figs. 74–76).

FEMALE: Unknown.

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Known only from San Antonio, Chile.

Notiothops birabeni (Zapfe), new combination
Figures 53–56

Fernandezina birabeni Zapfe, 1961: 141, figs. 1–7 (male holotype and female paratype from Quebrada de La Plata, Santiago, Región Metropolitana, should be in MNHNS, lost).

Otiothops lanus Platnick, 1977: 204, figs. 1, 2 (replacement name for *Fernandezina birabeni*, preoccupied in *Otiothops*).

NEW RECORDS: CHILE: **Región Metropolitana:** *Santiago:* Quebrada de La Plata, fundo La Rinconada de Maipú, Oct. 8, 1958–May 10, 1960 (W. Noodt, MNHNS), 3♂.

DISTRIBUTION: Known only from Santiago, Chile.

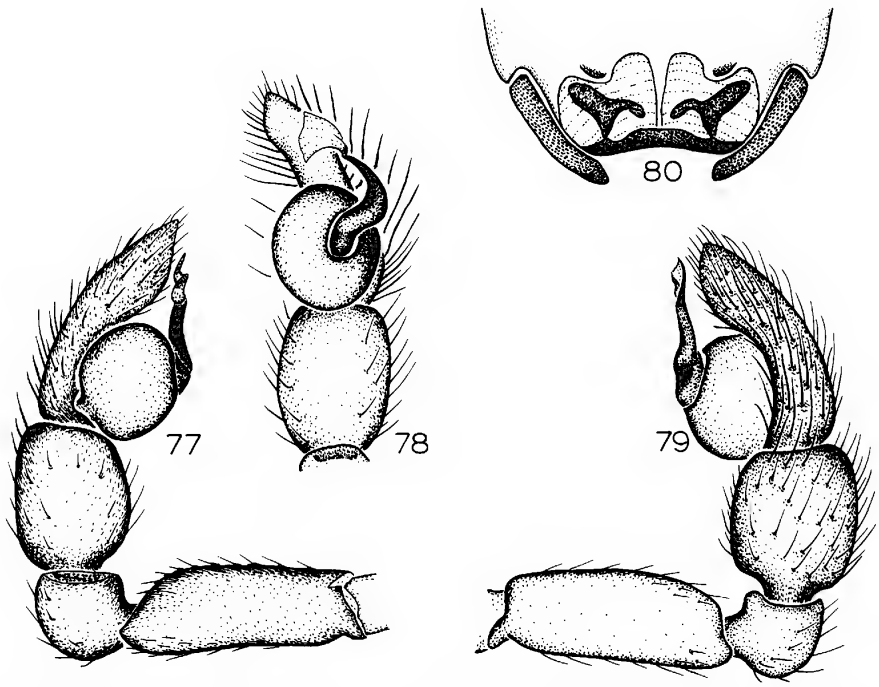
Notiothops maulensis (Platnick), new combination

Otiothops maulensis Platnick, 1985: 400, figs. 1, 2 (male holotype from W of Cauquenes, Cauquenes, Región VII (Maule), Chile, in AMNH, examined).

DISTRIBUTION: Known only from Cauquenes, Chile.

Notiothops cekalovici, new species
Figures 77–80

TYPES: Male holotype from Fundo Collico, 8 km S Florida, Concepción, Región VIII (Bío-Bío), Chile (Sept. 6, 1973; T. Cekalov-



Figs. 77–80. *Notiothops cekalovici*, new species. **77.** Left male palp, prolateral view. **78.** Same, ventral view. **79.** Same, retrolateral view. **80.** Female genitalia, dorsal view.

ic), and female allotype with the same data (Apr. 5, 1973), deposited in AMNH.

ETYMOLOGY: The specific name is a patronym in honor of the collector, Tomás Cekalovic.

DIAGNOSIS: As one would expect from its southern distribution, this species appears to be closest to *N. maulensis*, sharing with it a sigmoid embolar shape, but males lack the pronounced retrolateral expansion of the embolar base found in *N. maulensis* (figs. 77–79); females have distinctively long, laterally directed spermathecae (fig. 80).

MALE: Total length 3.01. Carapace 1.35 long, 1.01 wide. Femur I 1.05 long, 0.49 high. Abdominal scutum as in male *N. noxiosus*, abdominal dorsum with scattered purple pigment. Embolus sigmoid, with straight, bifid tip (figs. 77–79).

FEMALE: Total length 3.80. Carapace 1.77 long, 1.26 wide. Femur I 1.28 long, 0.50 high. Abdominal scutum as in female *N. noxiosus*, abdominal dorsum with scattered purple pigment. Spermathecae (under gross dissection only) relatively long, laterally directed (fig. 80).

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Known only from Concepción, Chile.

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